



ABSTRACT

Nutrigenetic effect on carotenoid bioavailability

Patrick Borel, Université de la Méditerranée, Faculté de Médecine, Marseille

Carotenoids are plant pigments assumed to be beneficial for human health (prevention of some degenerative diseases). The main dietary carotenoids are β -carotene, lycopene and lutein. Absorption efficiency of carotenoids is very variable and depends on numerous factors. The mnemonic "SLAMENGI" has been proposed to list the factors thought to govern carotenoid bioavailability. Each letter stands for one factor: Species of microconstituents, molecular Linkage, Amount of microconstituents consumed in a meal, Matrix in which the microconstituent is incorporated, Effectors of absorption and bioconversion, Nutrient status of the host, Genetic factors, Host-related factors, and mathematical Interactions. Recent studies have shown that, contrary to what was assumed, proteins (at least SR-BI and CD36) are involved in absorption of carotenoids by enterocyte. Our team was the first to suggest that genetic polymorphisms in genes encoding for these proteins can modulate absorption efficiency of these compounds. This hypothesis can explain the huge interindividual variability in absorption efficiency of these compounds. Recent results support this hypothesis. Indeed, groups of subjects bearing some rare genetic variants (single nucleotide polymorphisms) in locus of SCARB1 or CD36 have lower blood concentrations of carotenoids than groups of subjects bearing the common genetic variants at the same locus. However other studies are required to identify genetic variants which govern blood and tissue levels of carotenoids. Since most carotenoids seem beneficial for health at low, dietary, doses and can be hazardous at higher, pharmacological, doses it can be anticipated that recommended dietary allowances of carotenoids, or doses of carotenoids in functional foods/supplements, will be adapted to groups of the population carrying genetic variants known to significantly affect carotenoids bioavailability.

Patrick Borel

Université de la Méditerranée
27 Boulevard Jean-Moulin
13385 Marseille Cedex 5
France
Patrick.Borel@univmed.fr